

What is claimed is:

1. A Coriolis flow meter comprising:

a first flow tube (301) and a second flow tube (302) adapted to be vibrated in phase opposition about a plane of symmetry (708);

5 a drive system (D) adapted to vibrate each flow tube about axes connecting end nodes of each flow tube;

first vibrating components (D, LPO, RPO) including a first vibrating drive system component (C) affixed to said first flow tube;

10 second vibrating components including second vibrating drive system component (M) affixed to said second flow tube;

characterized in that said first and second vibrating drive system components are of equivalent size and position such that the moments of inertia of said first flow tube plus said first vibrating drive system component are substantially equal to the moments of inertia of said second flow tube plus said second vibrating drive system component.

2. The Coriolis flow meter of claim 1 characterized in that said first and second vibrating drive system components are sized to have substantially equal masses.

20 3. The Coriolis flow meter of claims 1 or 2 characterized in that end nodes (W') of said first flow tube and the combined center of mass (727) of said first flow tube plus said first vibrating drive system component (C) lie on a first balance plane (716) parallel to said plane of symmetry (708); and

25 end nodes (W) of said second flow tube and the combined center of mass (714) of said second flow tube plus said second vibrating drive system component (M) lie on a second balance plane (717) parallel to said plane of symmetry (708).

4. The Coriolis flow meter of any of claims 1-3 characterized in that: said first vibrating drive system component includes a coil component (C) of a driver affixed to said first flow tube; and

30 said second vibrating drive system component includes a magnet component (M) of said driver affixed to said second flow tube and coaxially aligned with said coil component.

5. The Coriolis flow meter of any of claims 1-4 characterized in that said first vibrating components further include a first pickoff component (602), and said second vibrating components include a second pickoff component (610).

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6. The Coriolis flow meter of claim 5 characterized in that said first pickoff component (602) is affixed to said first flow tube (301); and
said second pickoff component (610) is affixed to said second flow tube (302).

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7. The Coriolis flow meter of claim 6 characterized in that said first and second vibrating drive system components are sized to have substantially equal masses.

8. The Coriolis flow meter of claim 4 characterized in that:

15 end nodes (W') of said first flow tube (301) and the combined center of mass (727) of said first flow tube plus said first vibrating drive system component (C) lie on a first balance plane (716) parallel to said plane of symmetry (708); and
end nodes (W) of said second flow tube (302) and the combined center of mass (714) of said second flow tube plus said second vibrating drive system
20 component (M) lie on a second balance plane (717) parallel to said plane of symmetry.

9. A method of operating a Coriolis flow meter comprising the steps of:

a first flow tube and a second flow tube adapted to be vibrated in phase
25 opposition about a plane of symmetry;
a drive system adapted to vibrate each flow tube about axes connecting end nodes of each flow tube; said method comprising the steps of:
affixing first vibrating components including a first vibrating drive system component to said first flow tube;
30 affixing second vibrating components including a second vibrating drive system component to said second flow tube;
characterized in that said method comprises the further step of:

sizing and positioning said first and second vibrating drive system components to be of equivalent size and position such that the moments of inertia of said first flow tube plus said first vibrating drive system component are substantially equal to the moment of inertia of said second flow tube plus said
5 second vibrating drive system component.

10. The method of claim 9 including the further steps of sizing said first and second vibrating drive system components to have substantially equal masses.

10 11. The method of any one of claims 9 or 10 including the further steps of:
positioning end nodes of said first flow tube and the combined center of mass of said first flow tube plus said first vibrating drive system component on a first balance plane parallel to said plane of symmetry; and
positioning end nodes of said second flow tube and the combined center of
15 mass of said second flow tube plus said second vibrating drive system component on a second balance plane parallel to said plane of symmetry.

12. The method of any one of claims 9-11 including the further steps of:
affixing said first vibrating drive system components including a coil
20 component of a driver to said first flow tube; and
affixing said second vibrating drive system components including a magnet component of said driver to said second flow tube and coaxially aligned with said coil component.

25 13. The method of any one of claims 9-12 characterized in that said first vibrating drive system component further includes a first pickoff component and that said second vibrating drive system component further includes a second pickoff component; said method includes the further steps of:
affixing a first pickoff component to said first flow tube; and
30 affixing a second pickoff component to said second flow tube.

14. The method of claim 13 including the further step of:
sizing said first and second pickoff components to have substantially equal masses.

15. The method of any one of claims 9-14 including the further steps of:
positioning end nodes of said first flow tube and the combined center of
mass of said first flow tube plus said first vibrating drive system component on a
5 first balance plane parallel to said plane of symmetry; and
positioning end nodes of said second flow tube and the combined center of
mass of said second flow tube plus said second vibrating drive system component
on a second balance plane parallel to said plane of symmetry.